

**DRAFT  
- RATIONALE -**

**FOR PROPOSED AMENDMENTS TO THE HAWAII ADMINISTRATIVE RULE,  
CHAPTER 11-54, WATER QUALITY STANDARDS (WQS)**

**State of Hawaii, Department of Health  
Environmental Planning Office  
April 11<sup>1</sup>, 2005**

**(Blue font shows edits incorporated since the WQS Advisory Group meeting on April 8,  
2005.)**

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<sup>1</sup> **A note on the Ramseyer format:** The Ramseyer format is used to both [bracket] text to be deleted, followed by new text, to be underlined. The same format is used when paragraphs are moved from one location in the rule to another, even if no text or numbers are changed. Text to be moved is bracketed in its "old" position and underlined in its "new" position in the rule. Please check carefully for text edits versus "cut and paste" edits, because sections of the rule have been moved around to accommodate the amended classification of inland and marine waters with little or no change in the text, except to provide continuity.

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## ACKNOWLEDGEMENTS

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We are also pleased to acknowledge Dr. John Ford and his working group ( ), and Mr. Watson Okubo of the department's Clean Water Branch and his working group ( ) for their efforts in drafting the pesticide spraying proposal (11-54-4(d)) and the revised recreational waters proposal (11-54-8). And, we appreciated receiving comments on many of the proposals from our Water Quality Standards Advisory Group, through X meetings, in the course of which Y drafts were made available for review and comment.

## Introduction

### History:

The history of Hawaii's administrative rule for water quality standards (WQS) is traceable back to Chapter 37-A, Public Health Regulations, first effective in January 1968, and first amended effective in May 1974 after passage of the Clean Water Act Amendments (CWA) in 1972. Much of the existing content of Hawaii's WQS rule is based on the 1968 WQS rule and the 1974 WQS rule (effective in May 1974). Subsequent amendments were adopted in 1979 to satisfy the CWA Section 208 Basin Plan requirements. Later amendments incorporated the NPDES permit program, the CWA 401 Water Quality Certifications, which in some cases accompany the Department of the Army's CWA 404 permit for construction in waters of the U.S., and site-specific amendments for the Kona (west) coast of the island of Hawaii.

Interestingly, some phrases and terms from the first act, the Federal Water Pollution Control Act of 1948, have been retained in the existing Clean Water Act and existing WQS rule for Hawaii; for example the current designated uses have remained basically the same since 1948.

The Hawaii WQS rule is used to set enforceable discharge permit conditions under the state's delegated NPDES point-source permit program, which includes both individual and general permits. The rule also serves as the basis of comparison for preparation of the CWA 303(d) List of Impaired Waters, for preparation of Total Maximum Daily Load (TMDL) estimates, and provides a baseline for enforcement of CWA 401 Water Quality Certifications. According to a letter (September 8, 2003) from the State Attorneys General Department, the WQS are independently enforceable, and can be applied to serious human-caused water pollution events which are not voluntarily corrected by the responsible party.

The numeric WQS criteria are derived from data collected from minimally polluted state surface waters, and reflect conditions in Hawaii's natural waters.

### Sectors Affected by These Proposals Include:

- ❖ Consulting businesses and permit writers (the primary users of this rule) will find the amended classification of surface waters, which link waters more closely to salinity gradients than to geographic locations, easier to use. This classification is more appropriate. In most cases, pollutant concentrations decrease as salinity increases from land seaward to the deep ocean. This gradient in values of the numeric criteria is traceable from the upper reaches of streams to the transitional oceanic waters.
- ❖ The agricultural sector may: (1) find the rule simpler to use because we propose identifying only surface fresh waters as "inland waters", and moving all tidally-influenced waters into the marine waters section; and (2) be affected by conditions in the draft general permit (proposed Appendix M in HAR 11-55, Water Pollution Control), which accompanies the proposed aquatic pesticide discharge amendment in HAR 11-54-04 (d).
- ❖ Analytical laboratories may be affected by the new policy for laboratory approval before the department contracts with them for analytical work or recognizes their data as acceptable. (see p. xx),
- ❖ County waste water treatment plants (WWTPs) and private WWTPs holding NPDES permits for discharges into coastal waters may be affected by federally-driven changes in the use of sewage indicator bacteria as specific criteria for protection of public health in recreational waters..

- ❖ The construction sector may be affected by the requirement to use salinity-specific numeric criteria tables for discharges into state surface waters, but because soil runoff is the primary concern, and the proposed amendment leads to use of a table for brackish waters for stream estuaries (where fresh and saline waters mix), providing a sounder basis for WQS evaluations than does the existing "Table for Open Coastal Waters". (See the proposed Appendix A, Table 2, "Estuaries Other than Pearl Harbor and Brackish Coastal Waters".)
- ❖ The tourism sector, which will observe improvements in public notifications when waters are affected by high bacterial counts of potential public health significance.

The only areas in which additional costs may be incurred by both the private and public sectors are implementation of (1) the proposed aquatic pesticide discharge amendment for control of disease-carrying insect vectors such as mosquitoes (begins page x, line x); and (2) the proposed amendment to Section 8, on indicator bacteria and their relationship to the health of recreational waters users. This proposal, on indicator bacteria limits, is based on a recent federal rule, and may cause an increase in spending on wastewater treatment and disposal practices by the counties and private plants with NPDES discharge permits. (The final federal rule amends 40 CFR Part 131, and is titled "Water Quality Standards for Coastal and Great Lakes Recreation Waters; Final Rule" and published in Vol. 69, No. 220 on Tuesday, November 15, 2004.)

### **Background Discussion**

The original numeric criteria are listed in a paper titled "Report of the Technical Committee on Water Quality Standards - An Ecosystem Approach to Water Quality Standards", dated December 1, 1977 ("Report"), which was funded through a Clean Water Act Section 208 Areawide Waste Treatment Management Planning Grant from the U.S. Environmental Protection Agency (EPA). This document contains lists of the source materials used for drafting the 1979 Water Quality Standards Rule. (These source references have been scanned and inserted as pp. 25-28.) The original Water Quality Standards technical committee members were drawn entirely from the scientific community, and the rule was initially applied primarily to point source dischargers.

The numeric and narrative criteria are essentially unchanged since the 1979 rule was approved. However, scientists in Hawaii and elsewhere have made significant progress since then in understanding aquatic ecosystems and ranges of water quality parameters. As a result, the rule can be placed on a stronger scientific foundation than presently exists by proposing (2005) to link the criteria tables with salinity ranges. The final step in amending the WQS will be to apply for grant funds (\$250,000 over three years are needed) to collect and analyze additional transect samples, especially in fresh-to-brackish and brackish-to-saline transitional zones, in order to determine if any of the numeric criteria for different waterbody types require amendment. Using existing large data sets, we have shown that the salinity range-pollutant concentration link holds up, but we are planning to sample similar transects in minimally polluted areas to check the current values of the numeric criteria used in the rule.

### **General Features of the Proposed Amendments:**

The bulk of the amendments consist of proposed changes to the classification of state waters on the basis of gradients in salinity from streams seaward to the three-mile regulatory limit of state waters

**A change in classification is proposed to clarify the correct choice of a WQS numeric table to use for data evaluation in waters with differing salinity ranges, and thus allowing persons using this rule to more confidently differentiate between increased pollutant concentrations and natural composition (Figure 1, page x).**

In other words, salinity becomes the primary indicator guiding users' choice of a table of numeric criteria for use for the purposes of this rule.

Estuaries and brackish coastal waters have been moved from "Inland Waters" (section 5) to "Marine Waters" (section 6). Under this proposal, inland waters include surface freshwaters only, and marine waters include all brackish and saline surface waters. No numeric criteria have been changed, except in the table of oceanic criteria (now amended and renamed "Transitional Oceanic Waters") although selected parameter limits have been redescribed as ranges. This change was made to emphasize that freshwaters, which are not tidally-influenced, collect much of the existing pollutant load draining from the surrounding lands. Freshwater pollutant loads remain on land unless conveyed via streams, storm drains, sheet flows, or surfacing groundwater flows entering the ocean along the coastline and mixing with clean, tidally-influenced waters as they sweep through the island chain.

For example temperatures in fresh water streams are now described as  $\leq 30$  degrees Celsius, as a function of season and altitude, not as plus or minus one degree Celsius from "ambient", although measurements at control stations surrounding the proposed project area will be required. This amendment incorporates much more of the lower temperature range found in high altitude streams, and limits high temperatures to less than or equal to ( $\leq$ ) 30 degrees Celsius, which approaches the limit of survival for many aquatic organisms in Hawaii. Numeric criteria for salinity, pH, and dissolved oxygen have also been amended to show typical ranges for these parameters in different water body types.

The "[Guidelines for the Classification of State Surface Waters](#)" (two tables on pp. x-y), precedes the collection of all tables in sections 5 and 6 into Appendix A. These criteria tables have been moved into an appendix at the request of the Legislative Reference Bureau.

Other changes to the criteria tables are proposed that more accurately reflect environmental conditions:

(1) proposed deletion of the third column of numeric criteria in each table; (the "not to exceed 2 per cent of the time" column). [Criteria in this column were not based on data, but on statistical assumptions, and are included in the upper ten per cent of data values, from which the top two per cent can still be extracted. \(Most other states use only the overall geomeans and the ten per cent limits, which is all EPA requires.\)](#) Sample values above the upper two per cent limit are very variable, especially in shallow waters, and data sets are typically too small for evaluation of the upper two per cent of the values. The overall geometric mean and the "not to exceed ten per cent of the time" criteria have been retained without change with one exception - the oceanic table has been converted to a transitional oceanic waters table, as originally proposed in the 1977 Report; and

(2) proposed deletion of the "dry" criteria for brackish and saline [coastal](#) waters, on the basis that coastal waters are often brackish ( $> 0.05$  ppt to  $\leq 30.0$  ppt), and are by definition "wet" to the degree that they receive fresh water discharges along the coastline. The "more or less than three million gallons per day discharges along the coast" statements have also been deleted; there is no simple way to perform this evaluation. Rather, determination of the effect of freshwater input to brackish and saline coastal water quality, as measured by salinity is the primary guide to choosing the correct criteria table(s) to use for data evaluation.

Not all salinity ranges may be present all the time at every location.. Long dry periods will reduce or eliminate brackish coastal waters, whereas especially rainy periods will augment the seaward extent of these waters. **These salinity ranges move inshore and offshore, depending on tidal changes and frequency of rainfall events.**

If you have a set of sampling stations placed around a large Zone of Mixing, then you may have been measuring water quality in more than one salinity range.. It is to your advantage, and more accurate, to compare your data to tables of the same salinity range in which you

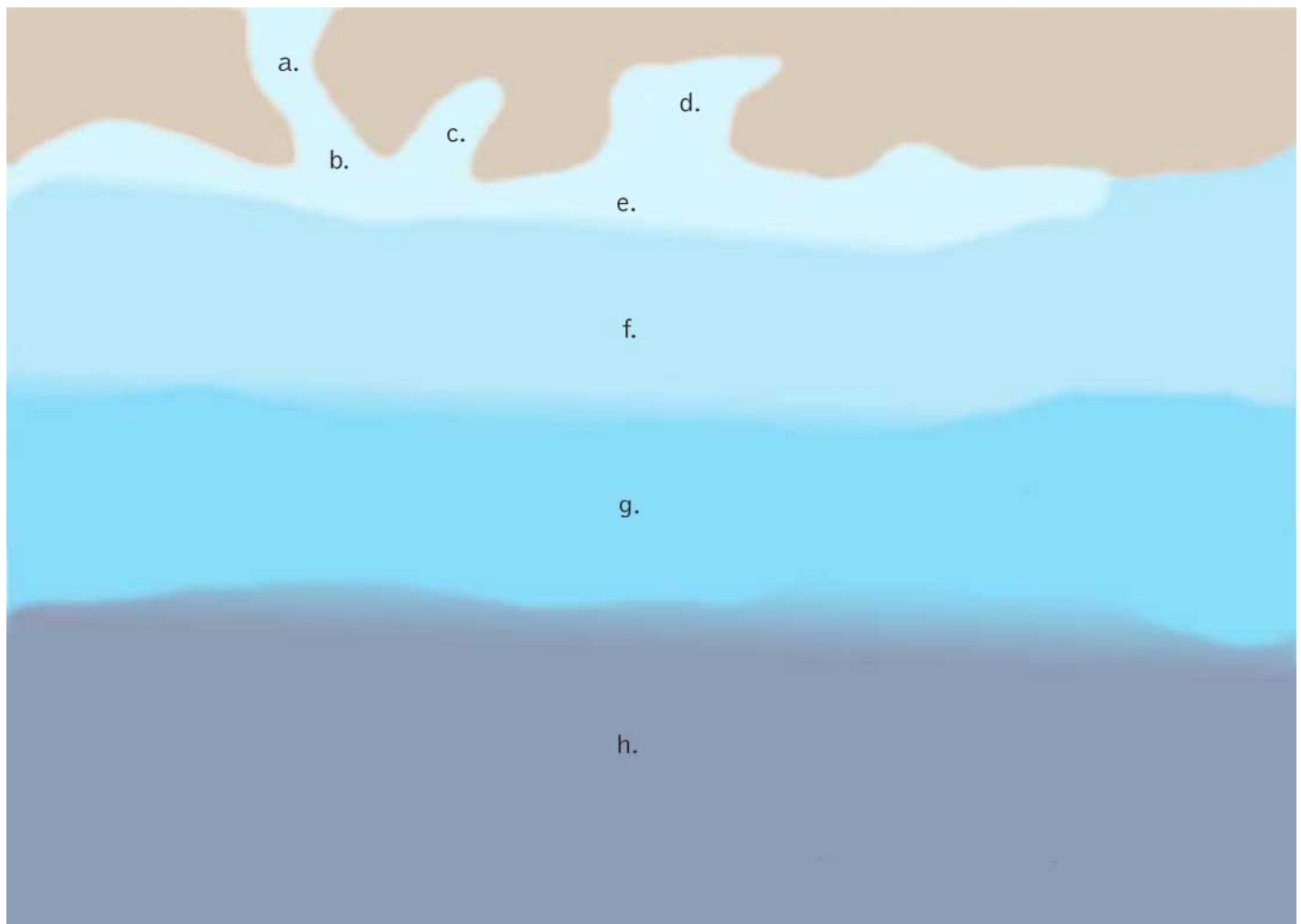
collected your samples to allow for the different parameter values at shoreline stations (often brackish) versus saline coastal water stations. (Please see Fig. 1, page x.)

**A graph of a dissolved nutrient concentration decline (say nitrate, because it is typically high at the shoreline) from shore out to sea provides a view of nitrate concentrations from anchialine pools (open circles; salinity = 0. to 10 ppt) seaward to waters of full salinity (> 34.9 ppt). Nitrate concentrations were above the conservative mixing line (another term for the WQS-salinity gradient) for the nitrate-salinity relationship in the pools, indicating addition of nitrates to the coastal pools from land-based sources near the coast, and below the mixing line as sample salinity increases to 35 ppt and greater, indicating biological uptake of nitrates, probably by phytoplankton (Figure 2).**

#### **Summary of Proposed Salinity Ranges**

Freshwaters	≤ 0.5 ppt (use current stream numeric criteria)
Brackish Coastal Waters	> 0.5 ppt to ≤ 30.0 ppt (use current estuaries table)
Saline Coastal Waters	> 30.0 ppt to ≤ 34.9 ppt (use current open coastal table)
Transitional Oceanic Table	>34.9 ppt to < 35.5 (use proposed table)

Figure 1. Schematic of Locations of Waters of Increasing Salinity



- a. Stream; salinity  $\leq 0.5$  ppt (freshwaters)
- b. Estuary; salinity  $> 0.5$  to  $\leq 30.0$  ppt (brackish waters)
- c. Narrow bay; salinity often brackish ( $> 0.5$  to  $\leq 30.0$  ppt) near back of bay; water may be saline ( $> 30.0$  ppt to  $\leq 34.5$  ppt) where it discharges into nearshore waters
- d. Harbor; usually partly or full constructed by humans; salinity often brackish ( $> 0.5$  to  $\leq 30.0$  ppt near back of harbor); water may be saline ( $> 30.0$  ppt to  $\leq 34.5$  ppt) where it discharges into nearshore waters
- e. Brackish nearshore waters (salinity  $> 0.5$  to  $\leq 30.0$  ppt), as a function of pattern and size of ground water seeps into tidally-influenced surface waters. Ground water flow lines generally converge toward deep indentations into the shoreline, resulting in brackish waters in the landward ends of narrow bays and harbors.
- f. Saline nearshore waters (salinity  $> 30.0$  ppt to  $\leq 34.5$  ppt)
- g. Transitional oceanic waters (salinity  $> 34.5$  ppt to  $< 36.0$  ppt)
- h. Oceanic waters (salinity  $\sim 35.0$  ppt; very stable)



Figure 2. Mixing Model of Biologically Reactive Nutrient Y

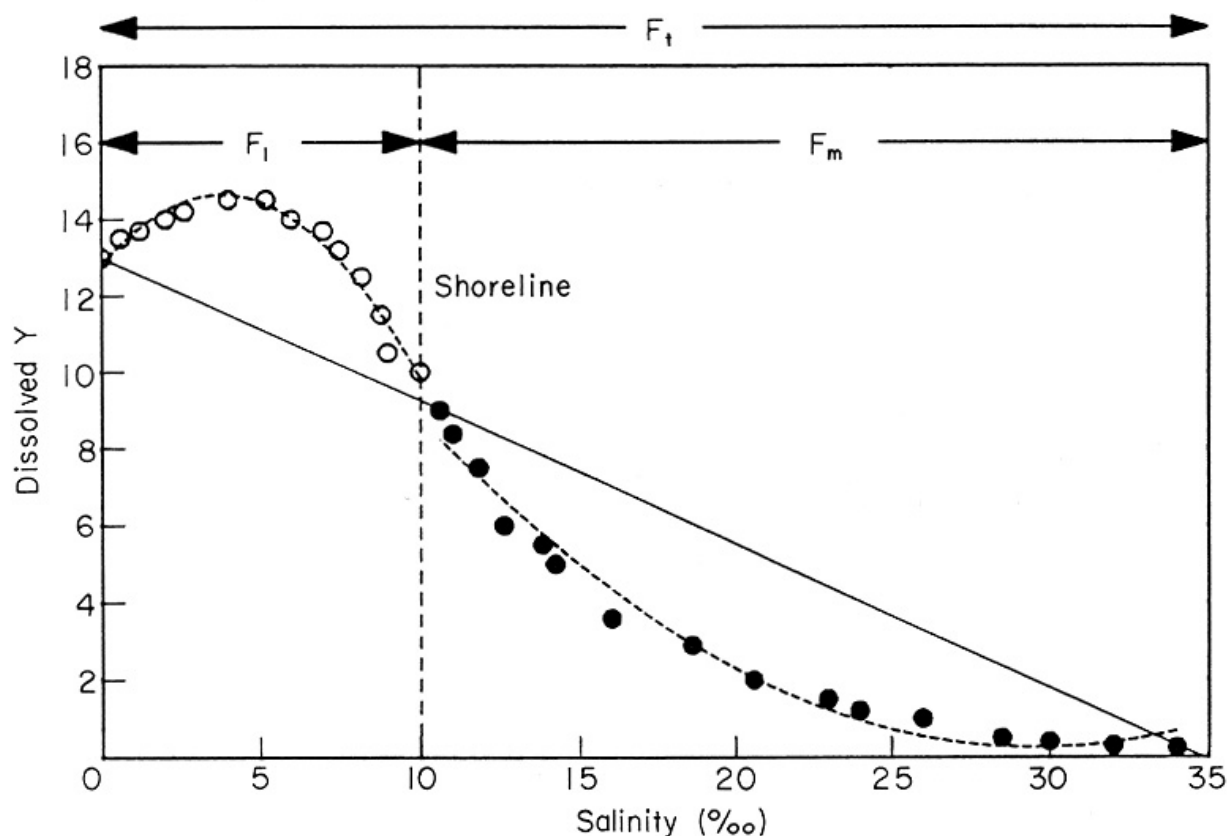


Figure 2. Idealized diagram representing mixing model of biologically reactive nutrient Y. The total flux of the system ( $F_t$ ) from endmember salinities in well water (0) to open coastal waters (35) is divided at the shoreline into land fluxes ( $F_l$ ) and marine fluxes ( $F_m$ ). Solid diagonal line represents conservative mixing line constructed by connecting endmember concentrations. Curved dashed lines are regressions of second order polynomials fitted through data points from pond samples (open circles) and ocean samples (solid circles).

From "Dollar, S.J. and M.J. Atkinson, 1992. Effects of Nutrient Subsidies from Groundwater to Nearshore Marine Ecosystems off the Island of Hawaii. *Estuarine, Coastal and Shelf Science*. 35:409 – 424."

Additional proposed amendments include changes to definitions (Section 1), addition of an allowance (Section 4(d)) for the direct discharge of aquatic pesticides into, near or over State surface waters and a "zero" or "one" scoring requirement for the narrative criteria in section 4(a).. Amendments to indicator bacteria requirements in Section 8 are also proposed to conform the section to the new federal BEACH Act requirements for coastal waters (most coastal states already classify estuaries as coastal waters); and addition of references to section 9.01, on "Zones of Mixing"..

After considerable reflection on the existing rule and discussions with investigators at the University of Hawaii, who are working on fresh water and marine ecosystems, including water quality, we have concluded that:

- ❖ because most pollutants originate on land and are initially transported in non-tidal freshwater flows to sea level, and then transported in tidally-influenced brackish and saline coastal waters seaward to transitional oceanic waters, a mixing gradient will exist such that pollutant concentrations and loads are progressively diluted by waters of increasing salinity from inland to the saline coastal waters and then to transitional oceanic waters; and
- ❖ because the quality of brackish coastal waters is covered by a table of specific numeric criteria for all estuaries except Pearl Harbor, the existing open coastal waters table (the "dry" criteria) is now applicable to only waters of salinity of greater than or equal to ( $\geq$ ) 30.0 ppt to less than or equal to  $\leq$  34.9 ppt . The "wet" criteria in the existing Open Coastal Waters table have been proposed for deletion because new data sets show that the water quality of coastal runoff and seeps is highly variably across both space and time, and should be covered in a table of estuarine criteria rather than in a table of open coastal waters criteria.

Consequently, we have reorganized the classification of state surface waters into inland waters (freshwaters only, salinity  $\leq$  05. ppt), and marine waters (brackish estuaries and brackish coastal waters of salinity  $> 0.5$  ppt to  $\leq$  30.0 ppt; and saline coastal waters of salinity  $> 30.0$  ppt to  $\leq$  34.9 ppt

Transitional oceanic waters have a salinity range of  $\geq 34.9$  ppt to  $\leq 35.5$  ppt, and salinities in the top 100 meters of open oceanic waters range from 34.4 ppt to 35.5 ppt, with the mode (the category with the most data values) at 34.9 ppt to 35.0 ppt). Transitional waters have fairly stable water quality, with parameter values lower and less variable than those found in saline coastal waters,.

Because the choice of a numeric criterion table is now linked to a salinity gradient from fresh to saline waters, we have deleted the embayment definitions and table as redundant. Note especially that the geometric mean values in the "Embayment Criteria Table" are almost identical to those for brackish coastal waters, for both the overall geometric mean and for the "not to exceed ten per cent" values. Another point to consider is that the embayment table appears to be used rarely, if at all. Where necessary, we have replaced the word "embayments" with "harbors and narrow bays". For example, we have retained the list of embayments to be protected, but now label them as "harbors and narrow bays".

We also provide a table (see page x, col. 5) of water quality parameter values summarized from about 14 years (1988 - 2003) of vertical profiling data collected in the top 100 m of deep ocean waters. The oceanic water column was sampled at Station Aloha 2, about

100 miles NE of the Hawaiian Islands (22 deg 45 min no sec N/158 deg no min no sec W), in 4500 m of water. The ranges given in the table on page x represent the ranges of standard deviations around the monthly mean for each parameter over 14 years. Note the lower concentrations of nutrients, and the highly stable and narrow range of values for salinity and pH compared to the oceanic waters table in the current rule. Aloha Station 2 is situated in the current flow before it reaches the islands, and represents the quality of water passing through the islands from the direction of the trade winds.

Comparison of the oceanic criteria tables shown on pages x & y clarifies that waters just seaward of saline coastal waters still reflect input of land-based materials. Transitional waters grade slowly into open ocean water conditions around the Hawaiian Islands, but the offshore locations and variability in width of these transition zones are unknown at present.

We propose to delete the 100 fathom depth contour delimiting the saline coastal waters from transitional oceanic waters on the basis that fully saline waters may occur either very near the shoreline, or two miles or more seaward, depending on the volume and frequency of land-based freshwater discharges.

In terms of environmental rationale, the salinity gradient is the best measure to use to distinguish zones of saline coastal waters from transitional oceanic waters, and to select the correct criteria table(s) to use to compare new data to the WQS.

## **BRIEF DESCRIPTION OF PROPOSED AMENDMENTS TO SPECIFIC SECTIONS**

**Please note that, for accurate and reproducible measurements of numeric criteria along onshore-offshore salinity gradients, at least three decimal places for salinity and pH measurements are preferred, but not required; and at least two decimal points for other numeric parameters are preferred, but not required.**

**Also note that only the major proposed changes to the content of each section are discussed; there are more minor proposed wording changes scattered throughout the Ramseyer-formatted sections.**

**Do not rely solely on this Rationale document to view every proposed change.**

### **HAR 11-54-1, Definitions.**

**Definitions of terms in Section 1 are restricted to technical words and terms; definitions of words used in everyday conversation, such as "harbors" or "undesirable" should be looked up in a recent dictionary. Major amendment proposals are listed in alphabetical order, below.**

- 1. We propose to delete the definition of "ambient conditions" from the rule, and delete all uses of the term in sections 2 - 10.**

**[Ambient conditions" means the water quality conditions that would occur in the receiving waters if these waters were not influenced by the proposed new human activity.]**

The current wording compares existing conditions at any time and place with conditions that may result after new development in the same area. The existing definition describes a "shifting baseline" approach to environmental management, in which current water quality, aquatic habitat, and aquatic community conditions are always accepted as prior (historical) conditions, thus allowing water quality, habitat and biota to be degraded over time from that which would fully support all designated and existing uses for the waterbody type. The existing definition of "ambient conditions" has raised antidegradation policy concerns both here and at EPA; consequently, we propose deletion of all instances of use of the term(s) "ambient" or

"ambient conditions" from the WQS rule. Note also that in the 1977 Report, the word "natural" in its plain English (dictionary) sense is used in the same positions in the proposed rule as the word "ambient", which was a later addition. The word "natural", when used in the rule, is defined in any recent dictionary.

We have replaced the definition of "ambient conditions" with a definition of "control stations" (see definition no. 3, below).

In the definitions, below, we propose changes to the salinity ranges of fresh, brackish, and saline waters to clarify that freshwaters originating on land (surface runoff, surfacing groundwater, and discharges from streams and storm drains) mix seaward, creating near shore areas of partially mixed freshwaters and saline waters (brackish conditions). These waters then mix seaward with coastal waters until full salinity is attained around the islands (salinity ~35.0 ppt in ocean waters).

2. "Brackish waters" means waters with dissolved inorganic ion concentrations (salinity) greater than 0.5 parts per thousand, but less than **[thirty-two]** or equal to thirty point zero (30.0) parts per thousand. All brackish waters are classified as marine waters.
3. "Coastal waters," means "all waters surrounding the islands of the State from the coast of any island to a point three miles seaward from the coast, and, in the case of streams, rivers, and drainage ditches, to a point three miles seaward from their point of discharge into the sea and includes those brackish waters, fresh waters and salt waters that are subject to the ebb and flow of the tide" (section 342D-1, HRS), For the purposes of this chapter, "coastal waters" include brackish estuaries, brackish coastal waters, and saline coastal waters. Transitional oceanic waters are found seaward of saline coastal waters, where the salinity ranges from is 34.9 ppt to 35.5 ppt.
4. "Control stations" means georeferenced stations, defined as points in the water column where water samples are collected and/or other measurements are taken.
5. "Designated uses" are those uses specified in water quality standards for each water body or segment whether or not they are being attained (40 CFR 131.3(f)) (For clarity, we propose adding the Clean Water Act definition of "designated uses" to accompany the present definition of "existing uses")
6. "Fresh waters" means all waters with a dissolved inorganic ion concentration of less than or equal to 0.5 parts per thousand. All fresh waters are classified as inland waters.
7. "Geometric mean (geomean)" means the central tendency in a set of non-normally distributed data. The geometric mean is calculated by taking either: (1) the antilog of the arithmetic average of the sum of the natural logs (ln) of a column of single parameter measurements at a site; or (2) the nth root of the product of all individual data values in a column of single parameter measurements at a site.. For the purposes of this chapter, geometric means shall be computed only for sets of greater than or equal to ten (10) single parameter measurements per site, where "sites" are project areas or lengths, and "stations" are places (points) where water samples are collected or field measurements made. (In order to clarify computation methods, we propose to add a definition of "geometric mean")

8. "Pesticide" means: (1) any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest (which may be microbial, plant or animal); and (2) any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant. (We propose adding a new definition, "pesticides", to accompany the proposed aquatic pesticides discharge proposal in Section 11-54-4(d))
9. "Reference sites (areas)" means geolocated examples of the different types of waterbodies and their associated water quality, aquatic habitats, and aquatic biota. These sites are distributed along quality gradients for each water body type, ranging from "very poor" quality to "poor", "good", "high", and "excellent" quality. Reference sites serve as models for assigning newly-monitored and assessed sites to an overall waterbody quality ranking. This information is used for water quality management purposes.
10. "Sample size (n)" means the number of measured values of one or more environmental parameters at a control station or project sampling station. (Note that three measurements per station are required for sampling under the site-specific criteria for the Kona (west) coast of the island of Hawaii). (In order to ensure that geometric means of data sets are reasonably characteristic of the waterbody in question, we propose adding this definition of "sample size".)
11. "Saline or salt waters" means waters with dissolved inorganic ion concentrations greater than **[thirty-two]** thirty point zero (30.0) parts per thousand and less than thirty-four point nine (34.9) parts per thousand. All saline waters are classified as marine waters.
12. "Transitional oceanic waters" means all marine waters of salinity greater than or equal to thirty-four point nine (34.9) ppt and less than or equal to thirty-five point five (35.5) ppt.

#### **HAR 11-54-2, Classification of state waters.**

As proposed in the "Introduction", only fresh waters are classified as inland waters; all brackish and saline waters are re-classified as marine waters. Sections 1, 2, 3, 5, 6 and 8 have been reorganized to reflect this proposal.

#### **HAR 11-54-3, Classification of water uses.**

**Note that, for all water uses, the words "open coastal waters" have been changed to either "brackish coastal waters", and/or "saline coastal waters".**

Subsection (b), Inland waters, paragraph (B) : We propose deleting the sentence reading **["Public access to these waters may be restricted to protect drinking water supplies."]** The Department of Health does not have authority to enforce this restriction, and, with the development of better water treatment methodologies, there is no longer a need to restrict recreational access.

Subsection (b) Inland waters, paragraph on Class 2 waters.: We propose to delete the inland water use for "shipping and navigation" because waters classified as "inland" are now only the State's freshwaters, of salinity  $\leq 0.5$  ppt. The portions of Hawaii's streams containing nontidally influenced fresh waters are not suitable for "shipping and navigation", **and this use has been redescribed as "commercial boating and ecotourism" to better describe the types of small, narrow, and shallow draft vessels than can move up and down Hawaii's streams.**

We propose moving all sentences pertaining to marine brackish or saline waters to subsection (c), marine waters, and, in paragraph (B) under (1) Class AA, we propose moving the recreational boundary seaward, from 300 m to 500 m, to widen the band of coastal recreational waters covered by the federal BEACH Act of 2000. Under Class A marine saline waters, paragraph (2), we have replaced the word "embayments" with the words "harbors and narrow bays". The definitions and table of numeric criteria for embayments are proposed for deletion on the basis that the proposed salinity ranges for brackish and saline coastal waters will cover the embayment category. We have, however, retained the list of embayment waters to be protected, renaming them as "harbors and narrow bays."

We also propose deleting the term "pristine" in favor of the word "natural" in marine saline waters. The primary dictionary definition of the word "natural" is "1 of, or arising from nature, in accordance with what is found or expected in nature," whereas "pristine" is defined as "1 characteristic of the earliest or earlier, period or condition; original (Webster New World Dictionary - Third College Edition.). Because of the sandalwood trade, followed by massive upper forest degradation by cattle, goats, etc, and later replanting with alien tree species, channelization of many streams, and large irrigation diversions systems for agriculture, as well as sedimentation arising from development-caused erosion and effects of alien and invasive species, fresh and brackish water quality, aquatic and riparian habitat, and aquatic communities are no longer "pristine". Shallow coral reefs in saline coastal waters and transitional oceanic waters are less heavily damaged, but the reef flats may be degraded by sediments and trash. Overfishing in the main Hawaiian Islands is another threat to the reefs. The Northwest Hawaiian Islands may be called "pristine", but there are signs of modern human disturbance in these areas as well.

Under subsection (d), marine bottom ecosystems, we have amended the text to show that Class I marine bottom ecosystems may be found beneath either Class AA or A marine saline waters, and that Class II marine bottom ecosystems may also occur beneath either Class AA or A marine saline waters (as described in the 1977 Report).

#### **HAR 11-54-4, Basic water quality criteria applicable to all waters.**

We propose amending paragraph "(a), All waters shall be free of substances....." to include a "yes" or "no" scoring system for the narrative criteria, which can be represented numerically as (0) = yes and (1) = no. We have included in each narrative criterion examples of the types of materials and conditions to which these criteria are applicable, and, when other data are submitted for the purposes of this chapter, we will also require reports (in the form of an additional spreadsheet column of "zeros" and "ones" and field notes ) on any material/conditions that are visible and should not be present,

We also propose moving paragraph 4(c) from its present position in the rule to a position directly after 4(a) (6) because (c) describes an exemption to narrative criterion (6). (Note that we have separated the agricultural lands exemption from 4(a)(6) in order to avoid confusion regarding the breadth of this exemption, which applies only to agricultural land uses.

#### **Rationale for removal of "Director of Health" From 11-54-4c (DOH/Clean Water Branch)**

In March of 2004, the CWB received complaints from the Storm Water Quality Program at the C&C of Honolulu), Commission on Water Resource Management (DLNR), and individuals on the silt discharged onto Ewa Villages Golf Course, West Loch Estates Golf Course, and into Pearl Harbor. An investigation found that silt was discharged by way of Kaloi Gulch, Honouliuli Gulch, and other unnamed flow paths in between. Both golf courses were heavily impacted with tons of silt and debris, the sedimentation basins at Ewa Villages Golf Course were overrun, and to this day have not been cleaned out. The golf courses are owned



by the C&C of Honolulu and were designed to be flood control features of the Ewa plain. However, the amount of silt and debris that came off lands mauka of the golf courses were beyond reasonable expectations.

The owners of the lands mauka of the golf courses have leased these lands to farmers, ranchers, and others who are supposed to have an approved Soil Conservation Plan as outlined in 11-54-4©. However, at least one lessee did not have an approved plan, as required by the landowner.

A farmer or rancher who has an approved Soil Conservation Plan is exempt from county grading ordinances, as long as a comprehensive conservation program is being actively pursued, or that the discharge has received the best degree of treatment or control, and that the severity of impact of the residual soil reaching the receiving body of water is deemed to be acceptable. To obtain the exemption, the farmer or rancher solicits the assistance of the Natural Resources Conservation Service, which formulates the Soil Conservation Plan with the farmer/rancher, and sends the completed plan to the Soil Conservation District and the director (Director of Health) for acceptance. In 27 years of service, I have never seen or heard of any Soil Conservation Plan being sent to the DOH for acceptance; consequently, we propose to delete the "Director of Health" from the agricultural exemption paragraph.

On Kauai, the farmer/rancher takes his Soil Conservation Plan (approved by the applicable Soil Conservation District) to the County of Kauai to obtain grading ordinance exemptions. He does not take it to the DOH. This system works well on Kauai.

Therefore, it is not in the long term interest of the DOH to be attached to a process that we are not involved in, while there exists another government agency where the process is very much applicable. We recommend the deletion of the words "the director" and recommend to the Soil Conservation Districts to work with the applicable counties in the interest of farmer/ranchers in regards to 11-54-4c. The DOH will still have the authority to step in where unacceptable amounts of silt enter into State Waters.

Narrative criterion (6) will then read, followed by the exemption for agricultural lands:

- (6) Soil particles resulting from erosion on land **[involved in]** subject to earthwork, such as the construction of public works; highways; subdivisions; recreational, commercial, or industrial developments; or the cultivation and management of agricultural lands.

**[(c)]** For agricultural lands, [T]he requirements of paragraph (a)(6) shall be deemed met upon a showing that the land on which the erosion occurred or is occurring is being managed in accordance with soil conservation practices acceptable to the applicable soil and water conservation district **[and the director]**, and that a comprehensive conservation program is being actively pursued, or that the discharge has received the best degree of treatment or control, and that the severity of impact of the residual soil reaching the receiving body of water is deemed to be acceptable.

Paragraph (b) has been retained in its original position by agency request; (b) lists the existing standards for pollutants causing acute and chronic toxicity, and lists fish-consumption standards for the protection of human health (to satisfy paragraph (a)(4)).

A new paragraph (d) is proposed which allows pesticide discharges directly into, over, or near surface waters for purposes of vector control, provided that conditions in the general permit proposed as Appendix M, HAR 11-55, Water Pollution Control, are met. (See draft of Appendix M for HAR 11-55, Water Pollution Control). Appendix M will be presented for public hearing at the same time as the amended WQS.

(d) State waters may contain pesticides in concentrations that exceed the limits in subsections (a) and (b) if the pesticides are:

- (1) Registered by the U.S. Environmental Protection Agency and licensed by the state department of agriculture or other state agency regulating pesticides.
- (2) Used for the purpose of maintaining, enhancing or restoring the designated or existing uses of a water body; controlling aquatic pests; or protecting public health against actual or potential sickness, disease, or harm, including, but not limited to, vector-borne diseases; and
- (3) Applied in a manner consistent with the labeling of the pesticide
- (4) Applied under permits required by the federal Clean Water Act, if any.

### **Rationale:**

**(Prepared by Paul Schwind, Rick Guinther, Sean O'Keefe, & Janet Ashman), and edited by the Department of Health)**

### **Rationale**

Parts prepared by John Ford and his group (Paul Schwind, Rick Guinther, Sean O'Keefe, & Janet Ashman), and other parts by the Department of Health, and edited by DOH.

### Summary of Justification

In light of court cases that have raised concerns, the Department of Health wants to amend its rules to make sure it can use pesticides to protect public health from vector-borne diseases when necessary and to provide legal authority for other pesticide uses. In particular, the department needs to be able to provide permits for certain pesticide use, if legally required by the federal Clean Water Act (CWA).

The use of pesticides is an essential component of efforts by the State of Hawaii Vector Control Branch and others to prevent the introduction of West Nile Virus (WNV) into the state and to prevent the spread of WNV, dengue fever and other mosquito-borne diseases within the state. Pesticides are also used to control other vectors (such as blackflies or biting midges), manage and restore natural resources (e.g., eradicate *Salvinia molesta* in waterways, control alien weeds in watershed areas, and restore anchialine pools), maintain ditches and reservoirs used for irrigation, and control some types of noxious aquatic animals.

These longstanding pesticide uses may be affected by recent rulings in which some courts determined that a National Pollutant Discharge Elimination System (NPDES) permit under the Clean Water Act (CWA) is required for certain pesticide applications to or over “waters of the United States”.

Two proposed revisions to the state water quality standards are necessary in order to make sure that these important pesticide uses may continue in full compliance with applicable laws. The proposed rule will allow the Department of Health to issue NPDES permits authorizing the use of aquatic pesticides when such permits are required under the Clean Water Act, or if the State desires stricter rules than federally required, as allowed by CWA Section 510.

### Legal History: Pesticides and the Clean Water Act

Various court cases in recent years have raised the issue of whether the application of a pesticide in accordance its Environmental Protection Agency (EPA)-approved label may require a NPDES permit under the CWA where the use results in pesticides being introduced into waters of the United States. With certain exceptions, an NPDES permit is required for the “discharge” of a “pollutant” from a “point source” to “waters of the United States” – all terms are defined 16



under the CWA. The resulting court decisions have caused uncertainty with regard to longstanding pesticide uses

Of particular interest to Hawaii is the Ninth Circuit case of *Headwaters v. Talent Irrigation District*, 243 F.3d 536 (9<sup>th</sup> Cir., March 12, 2001), in which the Court held that a National Pollutant Discharge Elimination System (NPDES) permit is required for the direct application of an aquatic herbicide to water because residual herbicide in the water was considered a pollutant. Direct application of aquatic pesticides in accordance with the FIFRA label requirements did not override EPA's NPDES permit requirements.

Historically, the EPA has not regulated pesticides, including aquatic pesticides (i.e., those specifically labeled for use in waterways), as pollutants under the Clean Water Act when properly applied in accordance with all requirements relative to water quality in the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). As part of the pesticide registration process, EPA evaluates potential label limitations based on the proposed use instructions for the product through toxicity test data and environmental fate data submitted for agency review. If the pesticide is registered for legitimate uses that could result in the pesticide being introduced into waterways, EPA has already expressly approved such uses on the national level through the pesticide registration process. For this reason, EPA has not required NPDES permits for these uses. However, different states have different sensitive natural resources, and additional care in application may be required when using registered pesticides in state waters with sensitive species.

#### EPA Guidance and Proposed Rulemaking on Pesticides

After contradictory rulings in lawsuits, EPA (May, 2001) said that enforcement against discharges of aquatic pesticides into state waters will be a low priority, provided that both of the following conditions are met:

- (1) The registered pesticide product is applied directly to waters of the United States in a manner consistent with its labeling; and
- (2) There are no egregious circumstances, such as those resulting in serious actual harm or which may present imminent and substantial endangerment to public health or the environment.

Low enforcement priority does not apply to pesticides that enter waters of United States through other pathways, such as storm water runoff, industrial wastewater (including discharges from pesticide manufacturers and formulators), or discharges resulting from the improper management or disposal of pesticides.

On March 29, 2002, EPA clarified that it will use its authority under FIFRA to prevent misuse of aquatic pesticides. EPA disagreed with the *Talent* case and said that lawful application of aquatic herbicides to ensure flow in an irrigation canal in a manner consistent with a federally-approved product label does not require a Clean Water Act permit. To be clear, the statement addresses the issue of how the Clean Water Act irrigation return flow exemption applies in certain situations where there has been lawful use of an aquatic pesticides.. In other circumstances where discharges are made into waters of the United States, FIFRA and the Clean Water Act may both be applicable and will be enforced.

EPA has issued numerous guidance letters since 2002 (see EPA website) that attempt to reconcile the CWA and FIFRA. The latest development is the recent Proposed Rulemaking and Notice of Interpretive Statement titled: "Application of Pesticides to Waters of the United States in Compliance with FIFRA", available at the Federal Register website, or at

[www.epa.gov/npdes/agriculture#pesticides](http://www.epa.gov/npdes/agriculture#pesticides). The proposal would amend 40 CFR Part 122, section 3, list of exclusions from the NPDES permit requirements, to add a new exclusion, paragraph (h) to read as follows.

"(h) The application of pesticides to waters of the United States consistent with all relevant requirements under FIFRA (i.e., those relevant to protecting water quality), in the following two circumstances:

- (1) The application of pesticides directly to waters of the United States in order to control pests. Examples of such applications include applications to control mosquito larvae, aquatic weeds, or other pests that are present in the waters of the United States.
- (2) The application of pesticides to control pests that are present over waters of the United States, including near such waters, that results in a portion of the pesticides being deposited to waters of the United States; for example when insecticides are aerially applied to a forest canopy where waters of the United States may be present below the canopy or when pesticides are applied over, including near, water for control of adult mosquitos or other pests."

If EPA finally adopts this proposed amendment, exclusion of certain pesticide discharges from NPDES permit requirements may be tested in court. At present, EPA's position is that pesticide uses meeting the criteria specified in its guidance documents and the proposed rule do not require NPDES permits.

#### Impact on Hawaii

The court decisions and EPA guidance documents described above raise issues in Hawaii under both the state's water pollution control regulations (Hawaii Administrative Rules (HAR) Chapter 11-55) and its water quality standards (HAR Chapter 11-54). HAR section 11-54-4(a)(4) states in part that "all waters shall be free of substances attributable to . . . pollutants, including . . . (4) . . . biocides . . . toxic or harmful to aquatic life." This could be read to bar pesticides if they are considered pollutants. HAR 11-55, Water Pollution Control, contains a permit system to regulate pollutants. Furthermore, HAR 11-54-5.2(a) presently bans "waste discharges" to certain inland waters and these sections could be read to bar the application of pesticides to these waters. "Discharge" typically refers to a discharge of pollutants under the CWA.

Under the current EPA guidance, pesticide products applied in accordance with the FIFRA label are not "pollutants" and therefore would not be subject to narrative and numeric standards in 11-54-4(a), (b); however, this could change under the final guidance still pending, or in the event of further rulings by the court.

In weighing the need for the proposed revision, maintaining the ability of state vector control personnel to continue to apply mosquito larvicides and adulticides in an effort to prevent the introduction and spread of West Nile Virus should be of paramount importance. However, consideration must also be given to other longstanding pesticide uses potentially impacted by this issue, including uses for natural resource restoration and management, and maintenance and operation of irrigation water systems.

#### Proposed Revisions

The language of the proposed Section 11-54-04(e) will accommodate both the possibility that EPA's revised guidance will require an NPDES permit for pesticide applications (since

existing language under HAR 11-55 covers this requirement??) and the EPA's current position (i.e., no permit required).

In addition to the proposed revision to Section 11-54-4, it is necessary to modify Section 11-54-5.2 and section 6 to address a special need to use aquatic pesticides for natural resource management in fresh, brackish and saline waters. The inland water criteria applicable to fresh waters covered only by the narrative standards go beyond the limitations described above under Section 11-54-4 to further prohibit any "waste discharge" into certain of these waters. In marine waters, the proposed revision will allow both restoration of native *Halocaridina* habitat in selected anchialine pools, and allow proper water pollution control. If EPA reverses their policy such that such pesticides would be classified as pollutants (i.e., "wastes"), the proposed language would be needed in order to preserve this use. The proposed revision will allow freshwater, brackish water, and saline habitat restoration in selected areas and with proper water pollution control.

The proposed WQS pesticide application rule, when adopted, will comply with Sections 11-54-1.1 (antidegradation policy), 11-54-3 (best control or treatment measures), and 11-54-10 (appropriate monitoring measures), and with the Hawaii Revised Statutes, Sections 322-1 and Sections 342D-50(a) and 342D-55.

The Department of Health also proposes a general permit for pesticide use related to the control of vector borne diseases to be placed in a new Appendix M in Chapter 11-55. Under CWA Section 510 states may adopt laws stricter than federal requirements, but not less strict, and new DOH rules to issue permits for pesticide could be characterized that way.

#### **HAR 11-54-5, Uses and specific criteria applicable to inland waters.**

Section 5 has been reorganized to include only freshwaters. Text and numeric criteria referring to brackish and/or saline waters have been bracketed in section 5, then moved to section 6 and underlined. Text associated with the pesticide amendment proposal in section 4(d) has been divided into a new set of sentences for section 5.2 (see below); similar sentences for section 6 are proposed for brackish and saline waters.

#### **Section 5.2 Inland water criteria (freshwaters only)**

(a) Criteria for springs and seeps, ditches and flumes that discharge into any other waters of the State, natural freshwater lakes, reservoirs, and low freshwater wetlands. Only the basic criteria set forth in section 11-54-4 apply to springs and seeps, ditches and flumes that discharge into any other waters of the State, natural freshwater lakes, reservoirs, and low freshwater wetlands. These water body types will be maintained in the natural state through Hawaii's "no discharge" policy for these waters. Waste discharge of any pollutant into these waters, is prohibited [(see paragraph 11-54-3(b)(1))] except when in compliance with section 11-54-4(d).

The table of specific criteria for streams has been moved to Appendix A as Table 1. Proposed amendments to the table include:

(1) deletion of the third column (the "not to exceed 2 %" column) **because these criteria were derived from statistical assumptions, not from field data, and can readily be retrieved from any data set large enough for the computations.** The overall geometric means of data sets, and the values in the ten per cent columns are retained. The two percent NTE values derived from measurements will often be skewed at an angle above the straight line connecting the overall geomeans and the "10 % values", especially in shallow waters, or in small data sets. The minimum sample size (n) needed for a "10 %" NTE" evaluation is ten at a single station, and for a "2% NTE" evaluation at a single station, n must equal 50 data points in order to estimate the 2% NTE for one extreme value.

(2) addition of a statement at the top of the table as follows: "All persons shall use this table when the measured salinity is less than or equal to 0.5 ppt;"

(3) amendment of the "temperature" limits to read "Shall not exceed 30 degrees Celsius, as a function of recent rainfall events and elevation at the sampling sites. At least three temperatures at control sites around the boundary of a project area shall be measured for comparative purposes, and temperatures within the project site shall be maintained within the range of control station temperatures."

(4) all of the existing numbers in the two remaining criteria columns - the overall geometric mean and the "not to exceed ten per cent" column have been retained, but the "dry season" and "wet season" statements have been amended to read "baseflow conditions" and "runoff conditions", respectively, in order to confirm the obvious - that rainfall events are not confined to the wetter months of November through April; and

(5) the "Dissolved Oxygen" statement has been amended to read: "Not less than eighty per cent saturation." Note that the word "ambient" has been deleted throughout the rule because of degradation (shifting baseline) concerns. The use of "ambient conditions" is now replaced by use of control stations.

(6) the definition of "sample size", general instructions for selecting control stations and sampling stations, and a requirement that all sampling stations and control stations be geolocated have been added to the page preceding the numeric criteria table.

The specific criteria tables and accompanying text for the two estuary tables have been bracketed in Section 5, moved to section 6 (text) and underlined; and moved to Appendix A (tables), and outlines changed to fit the new locations.

#### **HAR 22-54-6, Uses and specific criteria applicable to marine waters.**

Text relating to pesticide discharges into brackish and/or saline waters is placed at the start of section 6, after the section title and before paragraph (a).

Criteria for coastal wetlands, saline lakes, and anchialine pools. Only the basic criteria set forth in section 11-54-4 apply to coastal brackish or saline wetlands, saline lakes, and anchialine pools. Saline lakes, and anchialine pools will be maintained in the natural state through Hawaii's "no discharge" policy for these waters. Waste discharge of any pollutant into saline lakes and anchialine pools is prohibited ((see paragraph 11-54-3(b)(1))) except when in compliance with section 11-54-4(d).

We propose to move all numeric criteria tables for brackish and saline waters to Appendix A, and collect and/or amend accompanying text in section 6. As summarized in the "Guidelines", these tables have been amended in similar fashion as the table of criteria for streams, discussed in the Section 5 proposal, above. Section 6 now includes two tables for estuaries (separate tables for Pearl Harbor and for Estuaries Other than Pearl Harbor), one table for use in saline coastal waters (the existing "open coastal waters" table has been renamed for use in saline coastal waters only), and one table for transitional oceanic waters. We propose using the table of criteria for estuaries other than Pearl Harbor for brackish coastal waters until additional data from these waters are available.

Note that not only has the column of "2% not to exceed" values been proposed for deletion from the current "open coastal waters" table of criteria for brackish and saline coastal waters, but also the "wet" numeric criteria, on the basis that brackish waters are by definition "wet", and saline waters are by definition "dry". The variable influx of fresh waters from land causes significant variation in salinity close to shore, but this impact is much less pronounced as salinity increases in an offshore direction. The salinity measurements shall serve as the primary guide to the correct choice of the numeric criteria tables for evaluations of geometric means for date sets.

### Summary of Proposed Salinity Ranges

Freshwaters	≤ 0.5 ppt (use current stream numeric criteria)
Brackish Coastal Waters	> 0.5 ppt to ≤ 30.0 ppt (use current estuaries table)
Saline Coastal Waters	> 30.0 ppt to ≤ 34.9 ppt (use current open coastal table)
Transitional Oceanic Table	>34.9 ppt to < 35.5 (use proposed table)

Also see Figure 1(schematic of salinity ranges); and see the "Guidelines for Classification of State Surface Waters" (Guidelines) tables at the end of this document.

This system is workable because, over long distances, the mixing process is dominated by large-scale turbulent (patchy) flows containing variable amounts of fresh water and brackish/saline water, and not by molecular diffusion, which is significant only over short distances on the order of millimeters. Large-scale turbulent mixing causes gradients in measurements of most water quality parameters from fresh to brackish to saline waters; strict geographic boundaries, such as the 100-fathom depth contour separating saline open coastal waters from transitional oceanic waters, are no longer a sufficient guide to selection of the correct criteria table(s) to use with your data, although they were useful when the rule was initially approved.

Other changes to the current open coastal waters table include the statements

- ❖ Dissolved Oxygen - shall not be less than seventy-five per cent.
- ❖ Applicable salinity ranges are stated the top of each criteria table; and
- ❖ Temperature has been redefined relative to measurements at control stations surrounding the sampling area, [and brief explanations of control stations and sampling stations, and of sample size have been added.](#)
- ❖ [Geolocation of each control station and sampling station is also required, as control stations, at least, should be mapped for re-sampling by others at future times.](#)

#### **The table of oceanic waters has been reinterpreted:**

(1) The 1977 Technical Report contains two oceanic waters tables - one for "transitional oceanic waters", and one for "oceanic waters". The transitional oceanic waters table was modified in 1977 by adding some of the offshore Station Gollum data, and renaming it "oceanic waters". This table is now in the rule.

(2) Our review of water quality parameter data from Station Aloha 2, especially the top 100 m of the water column, shows that many parameters are reported at lower mean concentrations than in the present oceanic table in the WQS rule.

**Summary of Transitional Oceanic Table, Oceanic Table in Present Rule, and Aloha 2 Station Data from top 100 m of water column. (This table will not be placed in the rule.)**

<b>Water Quality Parameter</b>	<b>Transitional Oceanic Waters Criteria (1977)</b>	<b>Oceanic Waters Criteria (1977)</b>	<b>Existing Oceanic Waters Criteria</b>	<b>Aloha Station 2 Summary - top 100 m</b>
Salinity (ppt)	Within 10% of "ambient"	Within 10% of "ambient"	> 34.50	~35.00
pH (units)	8.1 ± 0.5	8.1 ± 0.5	8.1 ± 0.5	≥ 8.1
Dissolved Oxygen (% saturation)	≥ 75 %	≥ 75 %	≥ 75 %	> 97%
Temperature (deg. C)	± 1 deg. C from "ambient"	± 1 deg. C from "ambient"	± 1 deg. C from "ambient"	<22.9 (100 m depth) & < 26.2 (5 m depth). Mean ~ 23.9 deg
Total Nitrogen (ug/L)	(Kjeldahl analysis used; not comparable to present method)	(Kjeldahl analysis used; not comparable to present method)	50.00 / 80.00 (ug/L)	82.6 (ug/L)
Ammonia Nitrogen (ug/L)	1.5 / 3.0	1.0 / 1.75 (ug/L)	1.00 / 1.75 (ug/L)	-----
(NO3 + NO2) - N (ug/L)	2.0 / 3.5	1.5 / 2.5 (ug/L)	1.50 / 2.50 (ug/L)	0.28 (ug/L)
Total Phosphorus (ug/L)	12.0 / 21.0 (ug/L)	10.00 / 18.00 (ug/L)	10.00 / 18.00 (ug/L)	9.59 (ug/L)
Chlorophyll a (ug/L)	0.08 / 0.15 (ug/L)	0.08 / 0.12 (ug/L)	0.06 / 0.12 (ug/L)	0.12 (ug/L)
NTU (mg/L)	0.05 / 0.15 (mg/L)	0.03 / 0.01 (mg/L)	0.03 / 0.15 (mg/L)	-----

We decided to revert to the original "Transitional Oceanic Waters Table" from the Report, based on the observation that present oceanic waters criteria retain some land-based influences, whereas the Aloha 2 Station (open ocean) data show lower mean values for many of the same parameters. More data needs to be collected along transects across saline coastal waters into transitional oceanic waters, then out to the three-mile regulatory limit of State waters, to fill out our understanding of the transitional-open oceanic transition zone.

We propose renaming the present oceanic waters table in HAR 11-54-6 as "Transitional Oceanic Waters", and propose the following criteria to indicate that these waters are not fully oceanic, as compared to water quality at Station Aloha 2.

**Proposed New Transitional Oceanic Waters Table**

<b><u>Parameters</u></b>	<b><u>Source Data</u></b> (not to be placed in the rule)	<b><u>Geometric mean not to exceed the given value</u></b>	<b><u>Not to exceed the given value more than ten per cent of the time</u></b>
<u>Salinity Range</u>	<u>New Proposal =</u>	<u>&gt;34.9 - &lt; 35.5</u>	<u>-----</u>
<u>pH range</u>	<u>Kept from Current Rule =</u>	<u>8.1 ± 0.5</u>	<u>-----</u>
<u>Dissolved Oxygen (per cent saturation):</u>	<u>New Proposal =</u>	<u>≥ 85 %</u>	<u>-----</u>
<u>Temperature</u>	<u>New Proposal =</u>	<u>Within temp. range of control stations surrounding the sampling area</u>	<u>-----</u>
<u>Total Nitrogen (ug N/L)</u>	<u>Kept from Existing Rule =</u>	<u>50.00</u>	<u>80.00</u>
<u>Ammonium Nitrogen (NH<sub>4</sub>-N/L)</u>	<u>Transitional table (1977) =</u>	<u>1.50</u>	<u>3.00</u>
<u>Nitrate + Nitrite Nitrogen (ug(NO<sub>3</sub> + NO<sub>2</sub>) - N/L)</u>	<u>Transitional table (1977) =</u>	<u>2.00</u>	<u>3.50</u>
<u>Total Phosphorus (ug P/L)</u>	<u>Transitional waters table (1977) =</u>	<u>12.00</u>	<u>21.00</u>
<u>Chlorophyll a (ug/L)</u>	<u>Transitional waters table (1977) =</u>	<u>0.08</u>	<u>0.15</u>
<u>Turbidity (N.T.U.)</u>	<u>Transitional waters table (1977) =</u>	<u>0.05</u>	<u>0.15</u>

Salinity ranges for the site-specific WQS for the Kona (west) coast of the Island of Hawaii (see 11-54-6(d)) have been amended to conform to the ranges specified in the brackish coastal waters table (use table for estuaries other than Pearl Harbor), and in the saline coastal waters table (use the existing open coastal waters table).. Proposed amendments include: (1) changing the shoreline salinity boundary governing choice of fixed criteria or the regression method from 32.00 ppt to **30.00** ppt , which is the proposed new "boundary" between brackish and saline coastal waters; and (2) replacing the current salinity, pH, dissolved oxygen, and temperature statements with ranges and minimum values rather than using, for example, pH = 8.1 ± 0.5 units.



Paragraph "(a), In inland (fresh water) recreational waters ... " The remainder of paragraph (a) remains unchanged - the WQS is 33 enterococcus per 100 ml freshwater ( $\leq 0.5$  ppt salinity). [Changes to the criteria for brackish and saline waters are described below:](#)

The final federal rule implementing the federal BEACH Act was published on November 22, 2004, and applies to brackish and saline coastal waters only (salinity  $>0.5$  ppt to  $<35.5$  ppt, [including any transitional oceanic waters within the state's three-mile regulatory limit.](#)) For all brackish and saline waters from the shoreline to three miles offshore, we propose the following amendments (summarized)::

- ❖ Extend the offshore horizontal limit for [primary-use](#) recreational waters from 300 m to 500 m;
- ❖ Within [the state's three-mile regulatory limit](#), raise the current enterococcus WQS of 7 CFU/100 ml of brackish and saline waters (salinity  $>0.5$  ppt to  $\leq 35.5$  ppt) to the federal criterion of 35 CFU per 100 ml of brackish or saline waters, and apply it to all brackish or saline state surface waters [within the three-mile limit and to a depth of 33 m \(100 feet\)](#)
- ❖ Use the current single sample maximum of 100 CFU per 100 ml of brackish and/or saline water within the proposed 500 m recreational waters boundary;
- ❖ Set the single sample maximum for waters seaward of the 500 m horizontal boundary for primary use recreational waters to 501 CFU per 100 ml of brackish and/or saline water;

The advantages of this proposal are that bacterial counts can be made more accurately at the higher federal criterion of 35 enterococcus per 100 ml; and that Hawaii's data become comparable to data from other subtropical and tropical areas using the federal criterion. Chronic exceedances of the 35 CFU federal standard at a location will be followed up with sanitary surveys to determine if the source of enterococcus is human, animal, or soil.

There is no reliable scientific evidence that public health will be compromised by this change.

A more detailed description of the recreational waters amendment is provided by the DOH/Clean Water Branch, Monitoring Section:

### **Water Quality Standards Rationale - Indicator Bacteria Advisory group**

Watson Okubo, Team Leader/DOH/CWB  
Roger Fujioka, UH/WRRC  
Ross Tanimoto, C&C Honolulu/Dept Env Srvs  
Jeff Zimpfer, UH/Sea Grant

#### **1. Extend Indicator Bacteria WQS seaward beyond 300m to 500m**

After consulting with the Hawaii Chapter of the Surfrider Foundation, we recommend that the recreational waters boundary be extended seaward from 300 m to 500 m from the shoreline. By doing this, almost all surf sites in Hawaii would be located within the recreational waters boundary. Waters within the 500 m boundary include almost all recreational water activities near the shoreline. The following activities occur within this boundary: shore fishing, skin diving, swimming, surfing, hang gliding, jet skiing, kayaking, small vessel boating, outrigger canoeing, and reef-related activities (reef walks, limu gathering, night torching, etc.). Beyond 500 m from the shore, activities are more closely related to transient recreation uses not



requiring frequent full-body submergence, such as deep sea fishing (trolling), sailing, and canoe paddling.

## **2. Off shore single sample maximum (beyond 500m).**

Because most recreational activities are located within 500 m of the shoreline, the use beyond 500 m can be classed as light to infrequent use. Many coastal shore areas of Hawaii are undeveloped. Offshore recreational activities focus around areas of access such as small boat harbors, boat ramps, and parks with sufficient parking for vehicles. Other than these offshore areas near access points, recreational use is infrequent. In keeping with the Final Rule for Ambient Water Quality Criteria for Bacteria for infrequent use coastal recreation waters, the associated Single Sample Maximum of 501 per 100 ml of Enterococci is established.

## **3. Setting recreational use to a maximum 100 ft depth.**

Recreational activities conducted deeper than 100-feet does not exist. SCUBA divers do dive deeper than 100 feet but their activities are related to commercial operations (black coral collecting, fish traps, etc.) where the dangers, limited light, and bottom time does not identify this depth as recreational. Therefore the recreational WQS depth is established at 100-feet.

## **4. Raise Enterococci to Federal Standard in Marine (\*Brackish & Saline) Waters**

The heavy rains in 2004 have shown that storm water discharges into the coastal waters carry indicator bacteria at densities as high as or even higher than a sewage spill into the coastal waters. Our beach monitoring has shown repeatedly that after a storm event, indicator bacteria counts are elevated, requiring the Clean Water Branch to compute a running geometric mean on certain beaches exposed to storm water runoff. The cause of these high non-sewage related counts may be found in streams and drains carrying soil and often animal wastes into coastal areas. In light of these events, the advisory group recommends that we follow the EPA Water Quality Standards for Coastal and Great Lakes Recreation Waters; Final Rule and establish a geometric mean of 35 per 100 ml of Enterococci for our coastal waters. This proposed amendment represents a more realistic standard for our coastal waters impacted by streams high in non-sewage indicator bacteria.

Raising the standard to 35 per 100 ml will also allow the DOH microlab to use faster analytical methods that were not suitable for our current standard of 7 per 100 ml. Because most if not all coastal states use 35 CFU per 100 ml as their coastal waters standard, new analytical methods are under development for counts in the range of 35 CFU enterococcus per 100 mls, and not for lower counts. To continue with 7 per 100 ml as the coastal water standard would not be in the best interest of Hawaii as no new analytical methods are being looked into for counts around 7 per 100 ml.

Additionally, on September 21, 2004, Hawaii adopted an enterococci geometric mean of 33 per 100 ml and a single sample maximum of 89 per 100 ml for its inland fresh waters. To maintain a 7 per 100 ml enterococci geometric mean for estuaries and coastal waters within 300 meters from shore is confusing and illogical considering that the Hawaii and EPA marine waters enterococci geometric mean is 35 per 100 ml. For example, say that the stream water has an enterococci geomean of 30 per 100 ml as it flows into an estuary, then to the ocean where the WQS is 7 CFU per 100 ml water. Then, as the water flows through to the coastal waters, there is no compliance. But beyond 300 meters from shore the counts have dropped below 7 CFU per 100 ml, so there is compliance again. Therefore, we recommend that the coastal enterococci geometric mean be raised to match the federal marine geometric mean.

The advisory group recommends that the primary-use recreational waters be extended to 500 m from shore, and that waters beyond 500 m be classed as light use coastal recreational waters with a single sample maximum of 501 per 100 ml of enterococci, and that the coastal geometric mean for Enterococci be raised to the federal standard of 35 CFU per 100 ml consistent with the EPA Water Quality Standards for Coastal and Great Lakes Recreation Waters; Final Rule.

#### **HAR 11-54-9.01, Zones of Mixing.**

##### **Existing:**

"Water quality certification" or "certification" means a statement which asserts that a proposed discharge resulting from an activity will not violate applicable water quality standards. A water quality certification is required by Section 401 of the Act from any applicant for a federal license or permit to conduct any activity, including the construction or operation of facilities which may result in any discharge into navigable waters.

##### **Proposed Revision:**

"Water quality certification" or "certification" means a statement which asserts that a proposed discharge resulting from an activity will not violate applicable water quality standards and the applicable provisions of Sections 301, 302, 303, 306, and 307 of the Act. A water quality certification is required by Section 401 of the Act from any applicant for a federal license or permit to conduct any activity, including the construction or operation of facilities which may result in any discharge into navigable waters.

##### **Rationale:**

The proposed revision is to ensure that the State's Section 401 Water Quality Certification program is consistent with Paragraph 401(a)(1) of the Act, which states that:

"(a)(1) Any applicant for a Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters, shall provide the licensing or permitting agency a certification from the State in which the discharge originates or will originate, or, if appropriate, from the interstate water pollution control agency having jurisdiction over the navigable waters at the point where the discharge originates or will originate, that any such discharge will comply with the applicable provisions of sections 301, 302, 303, 306, and 307 of this Act..."

#### **HAR 11-54-10, Water quality analyses.**

Existing paragraph (a): "Laboratory analysis shall be performed by a laboratory approved by the department." is proposed for deletion in order to eliminate the department's approval of Quality Assurance/Quality Control plans and practices for analytical laboratories. Each DOH program should use its own criteria for selecting qualified contract laboratories for its analyses, or use EPO's policy.

#### **SOURCE MATERIAL USED IN 1977 FOR ESTABLISHING PROPOSED MARINE WATER COLUMN STANDARDS**

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- Lamberson, P. B. 1974. The effects of light on primary productivity In South Kaneohe Bay. M.S. Thesis. Univ. of Hawaii. 40 pp.
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- Laws, E. 1977. Baseline studies of phytoplankton communities at Sand Island and Mokapu sewer outfalls. City and County of Honolulu Contract No. F-274-76. 54 pp.
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#### SOURCE MATERIALS USED IN 1977 FOR ESTABLISHING CRITERIA FOR INLAND WATERS

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**- GUIDELINES -**  
**CLASSIFICATION OF STATE SURFACE WATERS**

**Level 1:** All surface waters must meet narrative criteria (11-54-4(a) and criteria for toxic chemicals and heavy metals (11-54-4(b)))

**Level 2** All water body types are identified in 11-54-2.

**Level 3:** All surface waters are classified as either inland or marine.

**Level 4:** All inland waters are fresh waters; all marine waters are either brackish or saline.

**Level 5:** Guidelines for using numeric criteria tables:

<b>INLAND FRESH WATERS</b> Fresh waters only  Use Table 1, p. x for numeric criteria for freshwaters streams	<b>MARINE BRACKISH WATERS</b> Brackish Estuaries Other Than Pearl Harbor  Use Table 2, p. x for numeric criteria for all estuaries other than Pearl Harbor	<b>MARINE BRACKISH WATERS</b> Brackish Coastal Waters; Not in Defined Estuaries  Use Table 2, p. x for numeric criteria for brackish coastal waters not in estuaries	<b>MARINE SALINE WATERS</b> Saline Coastal Waters  Use Table 3, p. x for numeric criteria for saline nearshore waters	<b>*MARINE SALINE WATERS -</b> Transitional Oceanic Waters  Use Table 4, p. x for numeric criteria for transitional oceanic waters
Salinity $\leq 0.5$ ppt	Salinity $> 0.5$ to $\leq 30.0$ ppt	Salinity $> 0.5$ to $\leq 30.0$ ppt	Salinity $> 30.0$ to $\leq 34.9$ ppt	Salinity $> 34.9$ to $\leq 35.5$ ppt
Classes - 1a, 1b, 2	Classes - AA, A, depending of protective status of adjacent lands	Classes - AA, A; depending on protective status of adjacent lands.	Classes AA, A	Class A

\*Recent open ocean data may be viewed at: <http://hahana.soest.hawaii.edu/hot/hot-dogs/interface.html>. The "HOTS" data from Aloha Station 2, 100 miles northeast of the islands.

**- GUIDELINES -**  
**CLASSIFICATION OF STATE SURFACE WATERS (continued)**

**Level 1:** All surface waters must meet narrative criteria (11-54-4(a) and criteria for toxic chemicals and heavy metals (11-54-4(b))

**Level 2:** All water body types are identified in 11-54-2.

**Level 3:** All surface waters are classified as either inland or marine.

**Level 4:** All inland waters are fresh waters; all marine waters are either brackish or saline.

**Level 5:** Guidelines for using numeric criteria tables:

<b>SITE-SPECIFIC CRITERIA FOR PEARL HARBOR Brackish Waters (Pearl Harbor Estuary Only)</b>	<b>SITE-SPECIFIC CRITERIA FOR KONA (WEST) COAST OF ISLAND OF HAWAII Brackish Coastal Waters Not in Defined Estuaries</b>	<b>SITE-SPECIFIC CRITERIA FOR KONA (WEST) COAST OF ISLAND OF HAWAII Saline Coastal Waters</b>
Use Table 5, p. x, for Site-Specific Numeric Criteria for Pearl Harbor Estuary	Use Table 6, p x, for Site-Specific Numeric Criteria for Kona Coast, Island of Hawaii	Use Table 6, p x, for Site-Specific Numeric Criteria for Kona Coast, Island of Hawaii
Sal. > 0.5 to ≤ 30.0 ppt	Salinity > 0.5 to ≤ 30.0 ppt	Salinity > 30.0 ppt to ≤ 34.9 ppt
Class A	Classes - AA, or A; depending on protected status of adjacent lands.	Classes - AA, A

Recent open ocean data may be viewed at: <http://hahana.soest.hawaii.edu/hot/hot-dogs/interface.html>. The "HOTS" data from Aloha Station 2, 100 miles northeast of the islands.